ABSTRACT

The invention relates to methods for the rapid detection, including quantitative detection, of actively respiring microorganisms. One embodiment comprises the steps of amplifying the presence of microorganisms utilizing microbial enzymatic conversion of tetrazolium salts to formazan products, detecting the presence of formazan product utilizing specific antibodies raised to formazans and amplifying the presence of the primary antibody with a secondary antibody conjugated to a detectable marker. Another embodiment of the invention comprises the steps of amplifying the microorganisms utilizing microbial enzymatic conversion of tetrazolium salts to formazan products, capturing digested microbial cell fragments with immobilized primary antibodies specific to the formazans and amplifying the presence of captured cell fragments with reporter antibodies prepared from the primary antibodies conjugated to a detectable marker. Another embodiment of the invention comprises the steps of amplifying microorganisms utilizing microbial enzymatic conversion of tetrazolium salt to formazan products, capturing digested microbial cell fragments on primary antibodies immobilized onto a solid sensor support and detecting the presence of captured cell fragments by the measurement of a change in either the physical, chemical electrical or optical properties of the sensor material.